



**U.S. Department of Energy
Technical Qualification Program**

Occupational Safety Qualification Standard

Study Guide

For the

***Construction Management and Engineering
Qualification Standard***

April 1996



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Competency 2.9 Construction management and engineering personnel shall demonstrate a familiarity level knowledge of the Occupational Safety and Health Act (OSHA) requirements in the following chapters of the Code of Federal Regulations:

- 29 CFR 1910, Occupational Safety and Health Standards
- 29 CFR 1926, Safety and Health Regulations for Construction

1. Supporting Knowledge and Skills

- a. Discuss how the Occupational Safety and Health Act applies to and impacts Department construction projects.
- b. Identify the requirements in the Occupational Safety and Health Act that form the basis of authority for construction management personnel in the oversight and management of construction projects.
- c. Discuss the basic requirements in the listed documents for each of the following areas associated with construction projects:
 - Personal protective equipment (PPE)
 - Electrical safety
 - Safety hazards associated with welding
 - Safety hazards associated with materials handling and storage
 - Safety hazards associated with machinery
 - Safety hazards associated with portable and hand tools
 - Safety hazards associated with concrete and masonry
 - Safety hazards associated with scaffolding
- d. Discuss the responsibilities of the construction manager in ensuring compliance with Occupational Safety and Health Act requirements.
- e. Describe the actions to be taken to correct a deficiency with the requirements of the listed documents.
- f. Develop an assessment plan for inspection of construction activities and the construction site for compliance with Occupational Safety and Health Act requirements.



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2. Self-Study Activities (corresponding to the intent of the above competency)

NOTE: Below are three web sites containing many of the references you may need.

Web Sites		
Organization	Site Location	Notes
Department of Energy	http://cted.inel.gov/cted/index.htm	DOE Standards, Guides, and Orders.
OSHA	http://www.osha-slc.gov/	OSHA documents and search engine
U.S. House of Representatives	http://law.house.gov/cfr.htm	Searchable Code of Federal Regulations

Read the summary section below.

Scan each of the following references for familiarization.

- 29 CFR 1910, *Occupational Safety and Health Standards*
- 29 CFR 1926, *Safety and Health Regulations for Construction*

EXERCISE 2.9-A Discuss how the Occupational Safety and Health Act applies to and impacts Department construction projects.

EXERCISE 2.9-B Identify the requirements in the Occupational Safety and Health Act that form the basis of authority for construction management personnel in the oversight and management of construction projects.

EXERCISE 2.9-C Using 29 CFR 1926 as a reference, locate the basic requirements for each of the three following areas associated with construction projects:

- Personal protective equipment (PPE)
- Electrical safety
- Safety hazards associated with welding

EXERCISE 2.9-D Using 29 CFR 1926 as a reference, discuss the accident prevention related responsibilities of the construction manager in ensuring compliance with Occupational Safety and Health Act requirements.



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EXERCISE 2.9-E While referring to 29 CFR 1910, describe the actions necessary to revise 29 CFR 1910 or 29 CFR 1926.

Review “Safety and Health Regulations for Construction,” Subpart K, “Electrical,” 29 CFR 1926, *Surveillance Guide*, prepared by the DOE Oak Ridge Field Office.

EXERCISE 2.9-F Develop an assessment plan for inspection of construction activities and the construction site for compliance with Occupational Safety and Health Act requirements.

3. Summary

OSHA Impact On Construction Projects

The OSHA has a definite impact on DOE construction projects. The act states that contractors cannot require work to occur in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to the worker's health and safety. It impacts construction projects by requiring employers to establish an occupational safety and health program in accordance with OSHA and DOE requirements.

OSHA-Related Authority

The OSHA contains a requirement that forms the basis of authority for construction management personnel in the oversight and management of construction projects. 29 CFR 1926.3 relates that requirement:

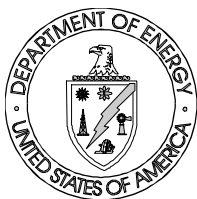
"It shall be a condition of each contract that is subject to section 107 of the *Contract Work Hours and Safety Standards Act* that the Secretary of Labor or any authorized representative shall have the right of entry to any site of contract performance for the following purposes:

- To inspect or investigate the matter of compliance with the safety and health standards contained in Subpart C of this part and following subparts; and
- To carry out the duties of the Secretary under section 107(b) of the act.

For the purpose of carrying out his investigative duties under the Act, the Secretary of Labor may, by agreement, use with or without reimbursement the services, personnel, and facilities of any state or federal agency. Any agreements with states under this section shall be similar to those provided for under the *Walsh-Healy Public Contracts Act* under 41 CFR part 50-205."



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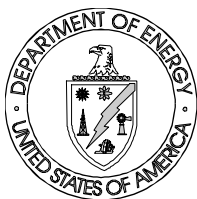
Basic Safety Hazard Requirements

The following table relates the basic requirements from 29 CFR 1926 regarding selected areas associated with construction projects.

Some Safety Hazard-Related Requirements of 29 CFR 1926	
Area	Requirement Section
Personal Protective Equipment (PPE)	1926.28 & 1926.95-.107
Electrical Safety	1926.400 - 1926.453 & 1926.950-.960
Safety Hazards Associated with Welding	1926.350 - 1926.354
Safety Hazards Associated with Materials Handling & Storage	1926.250 - 1926.252 & 1926.953
Safety Hazards Associated with Machinery	1926.952
Safety Hazards Associated with Portable & Hand Tools	1926.300 - 1926.307
Safety Hazards Associated with Concrete and Masonry	1926.700 - 1926.706 & 1926.854
Safety Hazards Associated with Scaffolding	1926.450 - 1926.453

Construction Management Responsibilities

The following table relates some of the basic responsibilities that 29 CFR 1926 places on the construction manager. The reference for each is indicated. However, for sake of brevity, the requirements are paraphrased.



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Construction Manager Responsibilities	
Area	Requirement
Prime Contractor Obligations	The prime contractor assumes all obligations prescribed as employer obligations under the standards contained in this part, whether or not he subcontracts any part of the work. (29 CFR 1926.16(b))
Requiring Work In Unsafe Conditions	No contractor or subcontractor shall require any worker to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his or her health or safety. (29 CFR 1926.20(a))
Accident Prevention	<ul style="list-style-type: none">• It shall be the responsibility of the employer to initiate and maintain occupational safety and health programs.• These programs shall provide for frequent and regular inspections of the job sites, materials, and equipment to be made by competent persons designated by the employers.• The use of any tool or equipment that is not in compliance with OSHA requirements is prohibited. The tool or equipment shall either be identified as unsafe by tagging or locking the controls to render it inoperable or shall be physically removed from its place of operation.• The employer shall permit only those employees qualified by training or experience to operate equipment and machinery. (29 CFR 1926.20)

Revising The Act

Title 29 CFR 1910.3 states that any interested person may petition in writing the Assistant Secretary of Labor to promulgate, modify, or revoke a standard. The petition should set forth the terms or the substance of the rule desired, the effects thereof if promulgated, and the reasons therefore.

Assessment Plans

An assessment plan for inspection of construction activities can be a useful tool. It is beyond the scope of this self study guide to cover this item in detail. A subject matter expert at your site should be consulted for review of this item. One reference that provides assistance and an actual assessment plan is the "Safety and Health Regulations for Construction," Subpart K, "Electrical," 29 CFR 1926, *Surveillance Guide*, prepared by the DOE Oak Ridge Field Office.



4. Exercise Solutions

EXERCISE 2.9-A Discuss how the Occupational Safety and Health Act applies to and impacts Department construction projects.

ANSWER 2.9-A The act states that contractors cannot require work to occur in surroundings or under working conditions that are unsanitary, hazardous, or dangerous to the worker's health and safety. It impacts construction projects by requiring employers to establish an occupational safety and health program in accordance with OSHA and DOE requirements.

EXERCISE 2.9-B Identify the requirements in the Occupational Safety and Health Act that form the basis of authority for construction management personnel in the oversight and management of construction projects.

ANSWER 2.9-B "It shall be a condition of each contract that is subject to section 107 of the *Contract Work Hours and Safety Standards Act* that the Secretary of Labor or any authorized representative shall have the right of entry to any site of contract performance for the following purposes:

- To inspect or investigate the matter of compliance with the safety and health standards contained in Subpart C of this part and following subparts; and
- To carry out the duties of the Secretary under section 107(b) of the act.

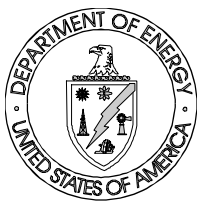
For the purpose of carrying out his investigative duties under the Act, the Secretary of Labor may, by agreement, use with or without reimbursement the services, personnel, and facilities of any state or federal agency. Any agreements with States under this section shall be similar to those provided for under the *Walsh-Healy Public Contracts Act* under 41 CFR part 50-205." (29 CFR 1926.3)

EXERCISE 2.9-C Using 29 CFR 1926 as a reference, locate the basic requirements for each of the following three areas associated with construction projects.

- Personal protective equipment (PPE)
- Electrical safety
- Safety hazards associated with welding



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ANSWER 2.9-C The following table identifies the basic requirements from 29 CFR 1926 regarding selected areas associated with construction projects.

Some Safety Hazard-Related Requirements of 29 CFR 1926	
Area	Requirement Section
Personal Protective Equipment (PPE)	1926.28 & 1926.95-.107
Electrical Safety	1926.400 - 1926.453 & 1926.950-960
Safety Hazards Associated with Welding	1926.350 - 1926.354

EXERCISE 2.9-D Using 29 CFR 1926 as a reference, discuss the accident prevention related responsibilities of the construction manager in ensuring compliance with *Occupational Safety and Health Act* requirements.

ANSWER 2.9-D The following table relates some of the basic responsibilities that 29 CFR 1926 places on the construction manager. The reference for each is indicated. However, for sake of brevity, the requirements are paraphrased.

Construction Manager Responsibilities	
Area	Requirement
Accident Prevention	<ul style="list-style-type: none">• It shall be the responsibility of the employer to initiate and maintain occupational safety and health programs.• These programs shall provide for frequent and regular inspections of the job sites, materials, and equipment to be made by competent persons designated by the employers.• The use of any tool or equipment that is not in compliance with OSHA requirements is prohibited. The tool or equipment shall either be identified as unsafe by tagging or locking the controls to render it inoperable or shall be physically removed from its place of operation.• The employer shall permit only those employees qualified by training or experience to operate equipment and machinery. (29 CFR 1926.20)



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EXERCISE 2.9-E While referring to 29 CFR 1910, describe the actions necessary to revise 29 CFR 1910 or 29 CFR 1926.

ANSWER 2.9-E Any interested person may petition in writing the Assistant Secretary of Labor to promulgate, modify, or revoke a standard. The petition should set forth the terms or the substance of the rule desired, the effects thereof if promulgated, and the reasons therefore. (29 CFR 1910.3)

EXERCISE 2.9-F Develop an assessment plan for inspection of construction activities and the construction site for compliance with Occupational Safety and Health Act requirements.

ANSWER 2.9-F An assessment plan for inspection of construction activities can be a useful tool. It is beyond the scope of this self-study guide to cover this item in detail. A subject matter expert at your site should be consulted for review of this item. One reference that provides assistance and an actual assessment plan is the “Safety and Health Regulations for Construction,” Subpart K, “Electrical,” 29 CFR 1926, *Surveillance Guide*, prepared by the DOE Oak Ridge Field Office.

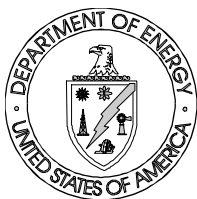


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Competency 2.17 **Construction management and engineering personnel shall demonstrate a working level knowledge of Department of Energy (DOE) Order 5480.9A, Construction Project Safety and Health Management.**

1. Supporting Knowledge and Skills

- a. Discuss the project manager/construction manager responsibilities set forth in DOE Order 5480.9A, *Construction Project Safety and Health Management*.
- b. Discuss the construction contractor's responsibilities under DOE Order 5480.9A, *Construction Project Safety and Health Management*, for each of the following:
 - Establishing a safety program
 - Worksite presence during work activities
 - Compliance by subcontractors
- c. Discuss the requirements for the performance of a Preliminary Hazard Analysis (PHA) and an Activity Hazard Analysis (AHA). Include in the discussion each of the following elements:
 - Responsibility for the performance of these analyses
 - Purpose and content of the analyses
 - When the analyses are required to be performed
- d. Discuss the contractor's responsibility for providing necessary training for employees in the area of safety and health on the worksite.
- e. Discuss the construction manager's responsibility for on-site safety and health inspections.
- f. Discuss the contractor's required response to an identified safety or health hazard.



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2. Self-Study Activities (corresponding to the intent of the above competency)

- NOTES:
- The DOE Orders are in a state of transition. Please refer to the following gopher site for a cross reference of new and old Orders:
gopher://VM1.HQADMIN.DOE.GOV:70/00/doemenu1/directiv/251cross.asc
 - Below are three web sites containing many of the references you may need.

Web Sites		
Organization	Site Location	Notes
Department of Energy	http://cted.inel.gov/cted/index.htm	DOE Standards, Guides, and Orders.
OSHA	http://www.osha-slc.gov/	OSHA documents and search engine
U.S. House of Representatives	http://law.house.gov/cfr.htm	Searchable Code of Federal Regulations

Read the summary section of this competency.

Review DOE Order 5480.9A, *Construction Project Safety and Health Management*.

EXERCISE 2.17-A What is the general project manager's/construction manager's responsibility as set forth in DOE Order 5480.9A, *Construction Project Safety and Health Management*? NOTE: It is not necessary to detail the specific responsibilities.

EXERCISE 2.17-B Discuss the construction contractor's responsibilities under DOE Order 5480.9A, *Construction Project Safety and Health Management* for each of the following:

- Establishing a safety program
- Worksite presence during work activities
- Compliance by subcontractors

EXERCISE 2.17-C Discuss the requirements for the performance of a Preliminary Hazard Analysis (PHA) and an Activity Hazard Analysis (AHA). Include in the discussion each of the following elements:

- Responsibility for the performance of these analyses
- Purpose and content of the analyses
- When the analyses are required to be performed



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- EXERCISE 2.17-D Discuss the contractor's responsibility for providing necessary training for employees in the area of safety and health on the worksite.
- EXERCISE 2.17-E Discuss the project manager's/construction manager's responsibility for onsite safety and health inspections.
- EXERCISE 2.17-F Discuss the contractor's required response to an identified safety or health hazard.

3. Summary

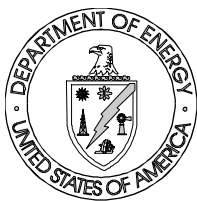
The Occupational Safety and Health Act (OSHA) became effective on April 28, 1971. The Act grants the Secretary of Labor the authority to promulgate, revise, and revoke safety and health standards; to inspect, investigate, and to issue citations; and to require employers to keep records of safety and health data. This authority includes a shared responsibility with other federal agencies for the adequacy of programs in the organizations reporting to them. The general provisions of the Act require each employer to furnish to each employee a place of employment free from recognized hazards, and to comply with occupational safety and health standards. DOE has recognized Title 29, Code of Federal Regulations, Part 1960 (29 CFR 1960) and OSHA requirements to be minimum standards for federal employees.

DOE Order 5480.9A, *Construction Project Safety and Health Management*, establishes the specific requirements for the management of occupational safety and health on Department of Energy (DOE) construction projects. OSHA standards and regulations such as 29 CFR 1910, *Occupational Safety and Health Standards*, and 29 CFR 1926, *Safety and Health Regulations for Construction*, are important documents for construction management and engineering personnel.

4. Exercise Solutions

EXERCISE 2.17-A What is the general project manager's/construction manager's responsibility as set forth in DOE Order 5480.9A, *Construction Project Safety and Health Management*? It is not necessary to detail the specific responsibilities for this exercise; state only the major responsibility.

ANSWER 2.17-A “The project manager is responsible and accountable for management of



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the construction project and for providing project oversight to ensure compliance by the construction contractor with the safety and health program requirements.” (DOE Order 5480.9A, Section 9.b.)

- EXERCISE 2.17-B Discuss the construction contractor's responsibilities under DOE Order 5480.9A, *Construction Project Safety and Health Management*, for each of the following:
- Establishing a safety program
 - Worksite presence during work activities
 - Compliance by subcontractors

ANSWER 2.17-B Your response should be similar to the one shown in this matrix.

Construction Contractor Responsibilities Under DOE Order 5480.9A	
Responsibility	Requirement
Establishing a safety program	“The construction contractor shall establish and maintain a program to protect the safety and health of all persons on the construction worksite to include his or her employees, employees of other contractors or subcontractors, visitors and the public. This program also shall protect against damage to property, materials, supplies, and equipment and prevent unnecessary work interruptions. The program shall ensure compliance by the construction contractor and all worksite subcontractors with the safety and health standards prescribed in the construction project acquisition documents.” (DOE Order 5480.9A, Section 10)
Worksite presence during work activities	“The construction superintendent or other duly designated contractor representative must be present on the worksite during the performance of any project work activities.” (DOE Order 5480.9A, Section 10.a.(2)) “During periods of active construction, the construction contractor shall conduct daily inspections of the worksite to identify hazards and instances of noncompliance with project safety and health requirements.” (DOE Order 5480.9A, Section 11.a.)



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Construction Contractor Responsibilities Under DOE Order 5480.9A	
Responsibility	Requirement
Compliance by subcontractors	<p>“The construction contractor shall establish and maintain a program to protect the safety and health of all persons on the construction worksite to include his or her employees, employees of other contractors or subcontractors, . . . ” (DOE Order 5480.9A, Section 10)</p> <p>“The construction contractor is responsible for ensuring compliance by all project subcontractors with project safety and health requirements. The construction contractor is further responsible for coordinating with project subcontractors . . . those occupational safety and health program elements addressing worksite hazards to which employees of other contractors may be exposed.” (DOE Order 5480.9A, Section 10.a.(4))</p>

EXERCISE 2.17-C Discuss the requirements for the performance of a Preliminary Hazard Analysis (PHA) and an Activity Hazard Analysis (AHA). Include in the discussion each of the following elements:

- Responsibility for the performance of these analyses
- Purpose and content of the analyses
- When the analyses are required to be performed

ANSWER 2.17-C “The construction contractor shall evaluate the work associated with each project phase to identify hazards to which worksite employees and other worksite personnel may potentially be exposed and to identify appropriate control measures. The construction contractor shall accomplish this through the performance of preliminary and activity hazard analyses as outlined below.” (DOE 5480.9A, Section 10.b.)

Preliminary Hazard Analysis (PHA)

- It is the responsibility of the construction contractor to prepare the PHA and the construction manager to approve the PHA.
- The PHA must be approved prior to commencement of work on the project.
- The PHA identifies specific hazards and appropriate control measures.



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- The PHA must identify the anticipated construction phases; the types of hazards associated with each phase and the potential control measures and programs. It must identify the phases of the project for which DOE-prescribed occupational safety and health standards or the construction project acquisition documents require that protective measures be designed, inspected, or approved by a professional engineer or other competent person.

Activity Hazard Analysis (AHA)

- The AHA is also the responsibility of the construction contractor to prepare and the construction manager to approve.
- The AHA must also be approved prior to commencement of work on the project except where the PHA fulfills the requirement for an AHA.
- The AHA expands upon the PHA and must identify the specific hazards associated with each activity to be performed in each phase and the actual control measures and programs planned to control the hazards. It must include drawings and/or other documentation for all protective measures for which the acquisitions documents or applicable occupational safety and health standards so prescribe. It must designate and identify the qualifications of the competent person or professional engineer that will conduct the inspections where so required.

EXERCISE 2.17-D Discuss the contractor's responsibility for providing necessary training for employees in the area of safety and health on the worksite.

ANSWER 2.17-D “The construction contractor shall ensure that each employee entering the worksite has, through experience, training, and where required, certification, the skills and knowledge necessary to safely perform his other assigned tasks. In addition, the contractor shall ensure that each employee receives initial worksite safety and health orientation and continued safety and health training addressing the hazards associated with the work and the measures necessary to control or eliminate the hazards.” (DOE Order 5480.9A, Section 10.c.)



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EXERCISE 2.17-E Discuss the project manager's/construction manager's responsibility for onsite safety and health inspections.

ANSWER 2.17-E While many safety and health requirements are delegated to the contractor, the primary responsibility for on-site safety and health rests with the project manager. “The project manager is responsible and accountable for management of the construction project and for providing project oversight to ensure compliance by the construction contractor with the safety and health program requirements.” (DOE Order 5480.9A, Section 9.b.)

“The project manager shall conduct inspections of all construction projects exceeding \$500,000 on at least a monthly basis during periods of active construction. For projects under \$500,000, the project manager shall develop and implement an inspection schedule which ensures that a representative sample of ongoing construction projects is inspected on at least a monthly basis. This shall be achieved both through a walk-around inspection of the worksite and through a review of the project safety and health plan and other safety and health program documentation. Findings of these inspections shall be documented in the project files.” (DOE Order 5480.9A, Section 11.c.)

EXERCISE 2.17-F Discuss the contractor's required response to an identified safety or health hazard.

ANSWER 2.17-F “The construction contractor shall take immediate corrective action to eliminate or control all identified hazards.

Where immediate correction is not possible or the responsibility for abatement falls outside the scope of the project, the construction contractor has four other responsibilities. They include notification of affected employees, posting warning signs, implementing further interim control measures, and notifying the construction manager and other responsible authorities. Corrective actions are to be performed in accordance with the hazard abatement methodology prescribed in DOE Order 5483.1A, *Occupational Safety and Health Program for DOE Contractor Employees at Government-Owned, Contractor-Operated Facilities.*” (DOE Order 5480.9A, Section 11.d.)